PREFACE

The National Institute of Hydrology, Roorkee is a premier research institution in the field of Hydrology and water resources. The institute has well equipped laboratories and the analyses and research output of the institute are of international repute. The excellent performance of Nuclear Hydrology Laboratory that participated in an international comparison exercise for environmental tritium measurement, organized by the International Atomic Energy Agency Vienna, Austria has proved the quality and standard of the laboratory at NIH.

It is imperative that the procedures adopted for collection of water and sediment samples for isotope analyses in the laboratory should be uniform and standardized. Further, it is also important to maintain a strict data quality control. The modern concept of good laboratory practices involves easy availability of the laboratory procedures to all users. To address these aspects, a procedural manual has been prepared that present the details of the procedures for water and sediment dating followed at Nuclear Hydrology Laboratory of the Institute. The manual contains four parts viz. 1) Radiocarbon dating, 2) Tritium dating, 3) Cesium–137 dating and 4) Lead–210 dating. The manual presents the underlying basic concepts, procedures and precautions to be adopted during sample collection, processing of samples, measurement of radioactivity using sophisticated nuclear instruments, and processing of acquired data. Much of these procedures have been collected from various sources such as published books, technical literature, standard operating procedures of renowned laboratories as well as personal experience of the scientists of the Institute. The scientists and project personnel working at the Nuclear Hydrology Division at this Institute have

put great efforts and hard work in the preparation of this manual. Particularly, Dr. Bhishm Kumar, Sc. E & Head, Dr. Rm. P. Nachiappan, Sc. B, Dr. M. Someshwar Rao, Sc. B, Mr. L. Gopi Kannan and Mr. Y. S. Rawat, both project officers working in different projects at the Nuclear Hydrology Division are the key personnel who have prepared this procedural manual.

I hope that the exhaustive information contained in the procedural manual will be highly useful for all the users of the Isotope Hydrology Laboratory facilities at NIH as well as other existing laboratories in the country. It will be especially useful to those who are planning to build these laboratory facilities at their institutions.

(K. S. Rama Sastri)
DIRECTOR